REMARKS/ARGUMENTS

Claims 1-39 are pending in the application. Claims 1, 14, and 27 have been amended. Reconsideration is respectfully requested. Applicants submit that the pending claims 1-39 are patentable over the art of record and allowance is respectfully requested of claims 1-39.

Claims 1-39 are rejected under 35 U.S.C. 101 because the invention is directed to non-statutory subject matter. Applicants respectfully traverse.

Claim 14 is rejected as being directed to non-statutory subject matter. Applicants respectfully traverse, but, in order to expedite prosecution, Applicants' have amended claim 14, to describe an article of manufacture comprising one of hardware logic and a computer readable medium. For example, Applicants' Specification at page 13, paragraph 38, recites:

> The term "article of manufacture" as used herein refers to code or logic implemented in hardware logic (e.g., an integrated circuit chip, Programmable Gate Array (PGA), Application Specific Integrated Circuit (ASIC), etc.) or a computer readable medium, such as magnetic storage medium (e.g., hard disk drives, floppy disks,, tape, etc.), optical storage (CD-ROMs, optical disks, etc.), volatile and non-volatile memory devices (e.g., EEPROMs, ROMs, PROMs, RAMs, DRAMs, SRAMs, firmware, programmable logic, etc.).

Claims 1, 14, and 27 are rejected as "the claims do not specify that the result neither stored nor output is displayed to a user or otherwise used in the real world. Applicants respectfully traverse, but, in order to expedite prosecution, Applicants' have amended claims 1, 14, and 27 to describe replacing the portion of corresponding data at the second source *in a storage device* with the portion of data at the first source (e.g., Specification, page 5, paragraph 14; page 7, paragraphs 20-22; Figure1; e.g., "In certain implementations of the invention, the portion of data is a track on a volume" and volumes reside on storage devices). Applicants respectfully submit that this satisfies the requirement of a "useful, concrete and tangible result."

Dependent claims 2-13, 15-26, and 28-39 were also rejected. Applicants respectfully traverse. Additionally, Applicants submit that these dependent claims, which depend from amended claims 1, 14, and 27, overcome the rejection, at least by their dependency.

Claims 1-2, 6-15, 19-28, and 32-39 are rejected under 35 U.S.C. 102(a) as being anticipated by Huang et al., U.S. Patent No. 6,493,727. Applicants respectfully traverse.

Anticipation requires that the identical invention must be shown in a single reference in as complete detail as is contained in the claims. Richardson v. Suzuki Motor Co., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Applicants respectfully submit that the Huang patent does not teach the identical invention as claimed.

Claims 1, 14, and 27 describe determining a first identifier for a portion of data at a first source, wherein a unique identifier is associated with each portion of data at the first source (e.g., Specification, page 7, paragraph 21, "In certain implementations of the invention, the unique identifiers are hash keys . . . there is a hash key created for each portion of data on the primary volume and one for each portion of data on the corresponding secondary volume"); determining a second identifier for a portion of corresponding data at a second source, wherein a unique identifier is associated with each portion of data at the second source (e.g., Specification, page 7, paragraph 21, " In certain implementations of the invention, the unique identifiers are hash keys . . . there is a hash key created for each portion of data on the primary volume and one for each portion of data on the corresponding secondary volume"); comparing the first and second identifiers; and, when the first and second identifiers do not match, replacing the portion of corresponding data at the second source in a storage device with the portion of data at the first source.

As described in the Specification, in the "Description of the Related Art" section, page 3, paragraph 7:

> In particular, in prior art systems, when two volumes lose synchronization for any reason, it is necessary for the primary site to send the entire volume of data to the secondary site. If many volumes are affected and/or the volumes are very large, this could take a considerable amount of time. Not only will it take a long time, but all the data being sent will increase the bandwidth used on the long distance data link tremendously.

To overcome these problems, the claimed invention compares the first identifier associated with a portion of data at a first source with a second identifier for a portion of corresponding data at a second source, and, when the first and second identifiers do not match, the *portion of corresponding data* at the second source is replaced in a storage device with the portion of data at the first source. Thus, with the claimed invention, in embodiments in which each source is a volume, copying an entire volume for resynchronization of data is avoided (e.g., Specification, page 7, paragraph 22).

On the other hand, the Huang patent describes that a "sequence number X is assigned to both of the first and second databases 176a and 176b" (Col. 4, lines 59-60). A new sequence identifier is generated that accompanies the common database (Col. 5, lines 43-50). Also, the current second database 176b has an associated sequence identifier (Col. 9, lines 40-47). Thus, the sequence numbers of the Huang patent are generated for each database, rather than for portions of data at a first source and portions of data at a second source, wherein a unique identifier is associated with each portion of data at the first source and wherein a unique identifier is associated with each portion of data at the second source. The Huang patent also describes a primary dirty flag PF and a secondary dirty flag SF, but each of these flags are also associated with databases rather than with portions of data. Thus, the Huang sequence identifiers and dirty flags do not anticipate the claimed first identifier for a portion of data at a first source, wherein a unique identifier is associated with each portion of data at the first source and second identifier for a portion of corresponding data at a second source, wherein a unique identifier is associated with each portion of data at the second source.

Additionally, the Huang patent describes that synchronization is performed by merely transmitting a copy of the altered first database 176a to the secondary device 106 to replace the second database 176b (Col. 5, lines 55-59). The Huang patent describes that the most recent merged database replaces the first and second databases (Col. 10, lines 1-4). Also, the Huang patent describes that the merged database 253a with content "ABC" becomes the first database 176ab in the primary device 103 and is also transmitted to the secondary device 106 to replace the second database 176b (Col. 10, lines 39-43). Thus, the Huang patent transmits entire databases, which does not anticipate, when the first and second identifiers do not match,

replacing the portion of corresponding data at the second source in a storage device *with the portion of data* at the first source.

Thus, claims 1, 14, and 27 are not anticipated by the Huang patent.

Dependent claims 2, 6-13, 15, 19-26, 28, and 32-39 incorporate the language of independent claims 1, 14, and 27 and add additional novel elements. Therefore, dependent claims 1, 14, and 27 are not anticipated by the Huang patent for at least the same reasons as were discussed with respect to claims 2, 6-13, 15, 19-26, 28, and 32-39.

Claims 3-5, 16-18, and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al., U.S. Patent No. 6,493,727, in further view of Salkewicz et al., U.S. Patent No. 5,970,502. Applicants respectfully traverse.

The Examiner submits that the Huang patent teaches the claimed first and second identifiers with the sequence identifiers for a database. Applicants respectfully traverse with reference to the arguments above. Additionally, the Examiner submits that the Huang patent does not specifically teach "hash keys", but that the Salkewicz patent teaches this. Applicants respectfully traverse. The Salkewicz patent describes hash buckets based on modulo 3 arithmetic performed on the record number, and the records within each hash bucket have not been maintained in any particular order (Col. 10, lines 1-9). The Salkewicz patent describes hash buckets that store records, which do not teach or suggest that a unique identifier is associated with each portion of data at the first source and at the second source, wherein the first and second identifiers comprise hash keys as described in claims 3, 16, and 29.

The Examiner submits that it would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to incorporate the teachings of Salkewicz et al. into Huang et al. Applicants respectfully traverse.

The law is well settled that a reference will not support a rejection based upon obviousness where the proposed modification to the reference contravenes the principle of operation of the device of the reference:

> If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. In re Ratti , 270 F.2d 810, 123 USPQ 349 (CCPA 1959)

The Huang patent already describes a technique of generating the sequence identifiers by "incrementing of the sequence identifier" (Col. 6, lines 38-41) or that the sequence identifiers may be obtained from an alphabet of sequence identifiers as described in co-pending U.S. patent application entitled "System and Method for State Synchronization" and assigned Ser. No. 09/499,320 (Col. 5, line 65 – Col. 6, line 4). Thus, the Examiner appears to be impermissibly modifying the Huang patent such that sequence identifiers are generated based on a hash technique. Additionally, the Examiner describes allowing "users of Huang to copy each segment of the data records." Again, the Examiner appears to be impermissibly modifying the Huang patent to copy a segment of data records rather than an entire database. Thus, Applicants respectfully submit that the proposed modification to the Huang patent contravenes the principle of operation of the teachings of the Huang patent, and so the Huang patent as modified does not support a rejection based upon obviousness.

Claims 4, 17, and 30 describe generating the hash keys using a single hash key function. The Salkewicz patent at Col. 10, lines 5-7, describes the remainder 0 hash bucket, the remainder 1 hash bucket, and the remainder 2 hash bucket. Applicants respectfully submit that the teaching of remainder hash buckets does not teach or suggest generating the hash keys using a single hash key function, wherein the first and second identifiers comprise hash keys (as described in claims 3, 16, and 29, from which claims 4, 17, and 30 depend).

Similarly, claims 5, 18, and 31 describe generating the hash keys using multiple hash key functions. The Salkewicz patent at Col. 10, lines 17-20 describes an alternative hashing scheme provides for has buckets which are maintained in numerical order. Applicants respectfully submit that the teaching of the alternative hashing scheme does not teach or suggest generating the hash keys using multiple hash key functions, wherein the first and second identifiers comprise hash keys (as described in claims 3, 16, and 29, from which claims 5, 18, and 31 depend).

Thus, claims 3-5, 16-18, and 29-31 are not taught or suggested by the Huang patent or the Salkewicz patent, either alone or in combination.

Conclusion

For all the above reasons, Applicants submit that the pending claims 1-39 are patentable over the art of record. Applicants have not added any claims. Nonetheless, should any additional fees be required, please charge Deposit Account No. 09-0449.

The attorney of record invites the Examiner to contact her at (310) 553-7973 if the Examiner believes such contact would advance the prosecution of the case.

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